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NATURAL FORMS IN ABSTRACT PAINTING

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in the College of Fine and Applied Arts
of the Rochester Institute of Technology
Date of Submission--July 23, 1970
Advisor--Phillip Morsberger

DEDICATION:

To my husband and children, who managed to fend for themselves long enough for me to finish this thesis.

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STATEMENT OF THE THESIS PROPOSAL:

The purpose of the Thesis is to accomplish a series of abstract paintings examining and illustrating the parallel of form in art and nature, using organic and inorganic forms (microscopic forms derived from animate and inanimate substances in nature) in combination or separately and interpreted through the medium of human personality.

In other words, my intention was to work from photos of natural substances, animate and inanimate, and to produce six abstract paintings on this theme. The reason for selecting natural forms as opposed to others was solely my preference for this type of form over anything architectural or man-made. I have limited myself to purely microscopic or macroscopic forms taken from microphotos of natural objects, since they seem to have virtually unlimited visual possibilities, with the further advantage of bearing little resemblance to our impression of the object when we see it as a whole. These sections offer a totally different impression of reality than that seen by the naked eye and are abstract in themselves. They also bear a striking resemblance to abstract paintings of various types, a fact which is illustrated and discussed later in this text. Lacking the magnifying apparatus or microscope needed to do my own microphotography, the microphotos used are from books, magazines, and scientific journals. A short explanation of microphotography follows this introduction.

THE TECHNIQUES OF PHOTOMICROGRAPHY AND PHOTOMACROGRAPHY

"The photographs which are discussed in the following text show more than can normally be seen with the naked eye. Photographic lenses, can act just like magnifying lenses when the eye is placed at a certain distance behind them."[1] A magnified reproduction of a small object made through such a lens is referred to as photomacrography. Photomicrography, however, deals with subjects that are so minute that they require enlargement by a microscope in order to be photographed. "A microscope may be compared with an accessory lens which enables photos to be taken on a larger scale, but the microscope is a complete and complicated optical system in itself"[2] A microscope has three basic parts: (1) the objective, which is a minute lens-system of short focal length which forms an image in the (2) drawtube, which is the cylindrical case, and (3) the eyepiece, which magnifies the same image once again so that it can be observed and photographed. The most frequent type of illumination in microphotography is transmitted light in the ground of a specicmen prepared on a transparent or translucent slide. Light is transmitted through the object. A polarizing filter is often used to eliminate unwanted light sources and to vary the amount of light transmitted. The main difference between photomicrography and photomacrography is one of scale and degree of magnification, since photomicrography requires use of a microscope and photomacrography a lens of lesser magnification. "Science and technology accept photomicrography as a very useful instrument of research, because it offers a means of widening present horizons and fields of know-

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[1] Creative Photo Micrography, Croy, p.8

[2] Creative Photo Micrography, Croy, p.52

ledge"[3] In a way, photomicrography and photomacrography do sort of the same thing that art does, i. e., taking a small section of reality that otherwise could not be seen or would not be noticed and, in effect, putting it in a spotlight so that we can focus on it. The camera, however, shows us everything it sees, while the artist is able to be selective in the forms he uses.

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[3] Creative Photo Micrography, Croy, p.49

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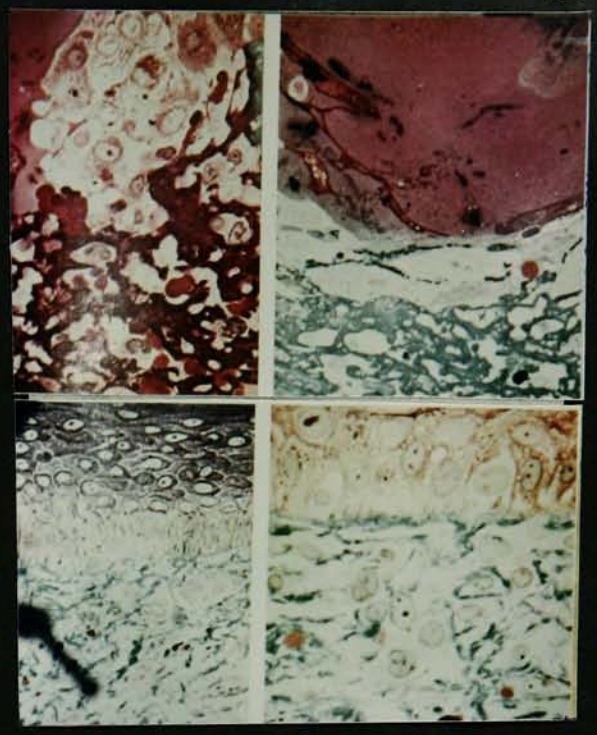

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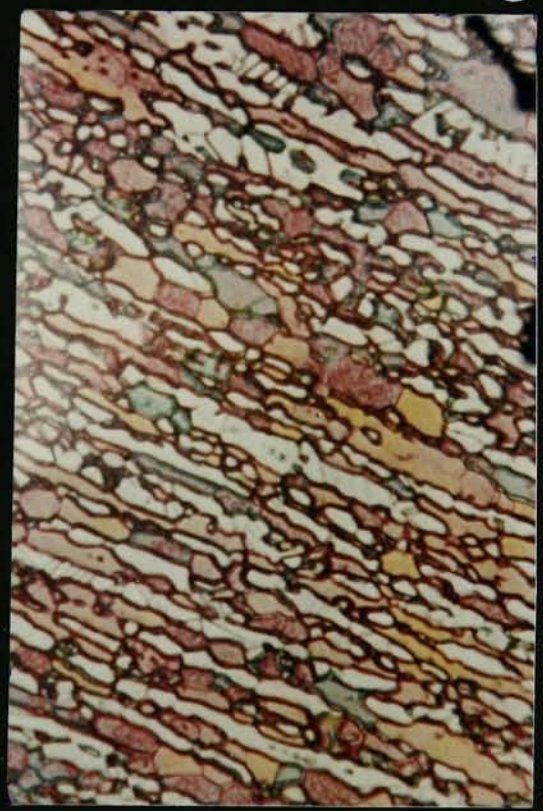

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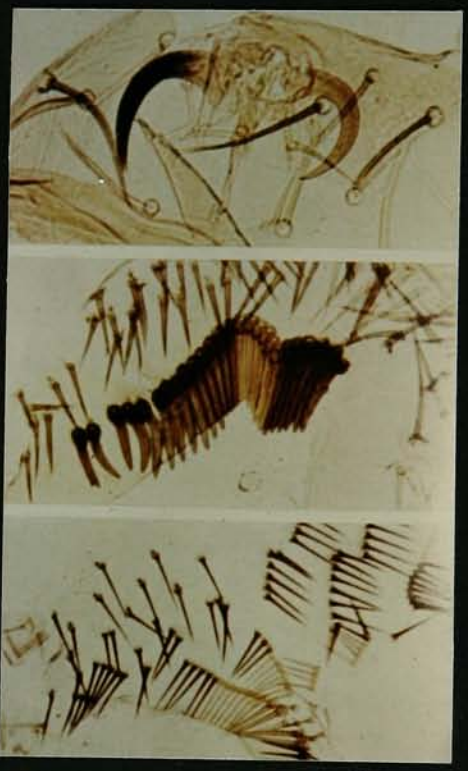

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PARALLEL FORMS IN NATURE AND ABSTRACT ART:

In 1958, an exhibition was organized at the Kunsthalle, in Basle, Switzerland which, at the time, aroused a great deal of attention and controversy. This exhibition, entitled "Form in Art and Nature", presented a selection of paintings and sculpture of the last fifty years, shown alongside a selection of corresponding photomicrographs. A book was later published, following the theme of this exhibition, which sought to shed some light on the curious coincidence of form found in the works of art and the microphotos. Some of the illustrations from this book are reproduced here to show the comparison between the selected paintings and the scientific microphotos.

After all the pictures in this exhibit were paired with their related microphotos, it was observed that a distinction could be made between those paintings compared with organic substances and those paired with inorganic substances. Georg Schmidt, in the book, Form in Art and Nature, states that these paintings fell into two main groups: "geometrical paintings were found paired with the photographs of inorganic substances and the abstract expressionist paintings with those of organic ."[1] In this book the term "inorganic" is used to designate inanimate substances and "organic" to refer to animate substances. According to Schmidt, this geometrical group, corresponding to crystalline structures, has three subdivisions: analytical cubism, which he likens to Picasso and Gottried Honegger, geometric two and three dimensional constructivism exemplified by Mondrian, Serge Poliakoff, and Max Bill, and finally, spatial penetration of line, color and surfaces as evidenced by Jean Bazaine, Mark Tobey, and Jean Paul Riopelle. This is an interesting obser-

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[1] Form in Art and Nature, Georg Schmidt, p.30

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"Riopelle's painting is important because it signifies a fusion of guided instinct with refined vitality, and sounds vigorously like Bartok's Allegro Barbaro."[2]

"Sam Francis' proliferating, peacock blue, glowing green, hyacinthlike amoebae creep like vines in the white depths of space."[3]

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[2] Adventure of Modern Art, Oto Bihalji-Merin, p.70

[3] Adventure of Modern Art, Oto Bihalji-Merin, p.73

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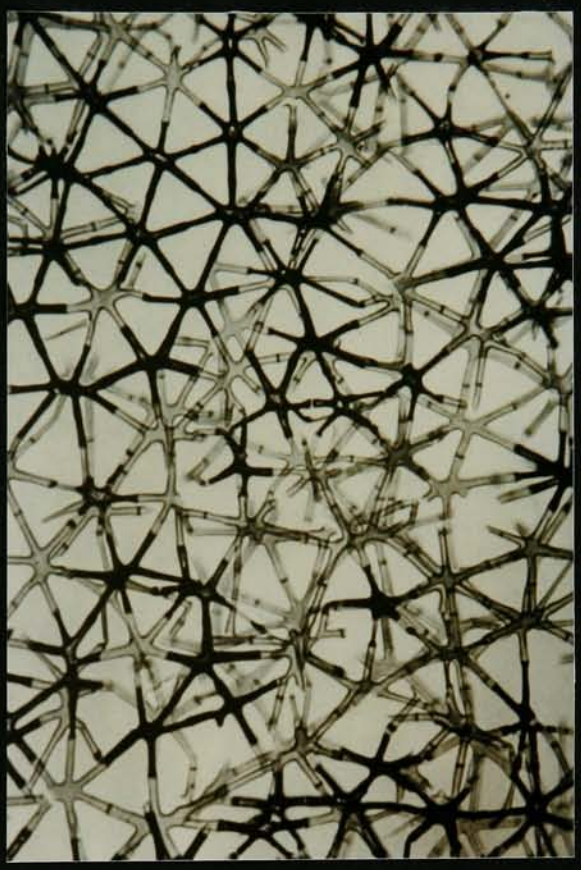

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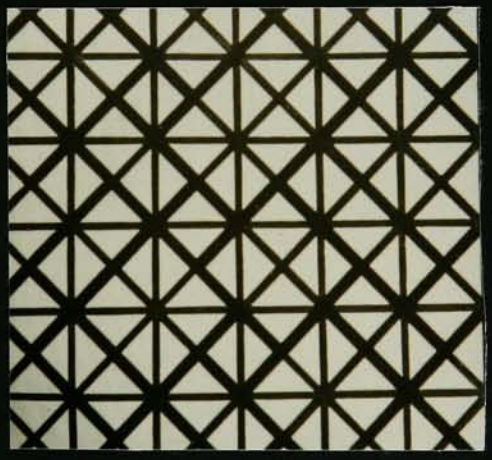

vation, but a question presents itself, pertaining to the three subdivisions given for the geometrical group- do all of these paintings belong under the heading of geometric painting, especially those in the third category? The only connection that Riopelle's painting could have with geometric painting would be the angularity of the applied paint. The fact that you have to divide this "geometric group" into subdivisions at all, suggests to me a kind of attempt to divide this exhibit neatly without leaving any loose ends. I also wonder if we can call it a rule that the microphotos of granite and crystals will always align with geometric painting, and that the microphotos of animate life will always align with abstract expressionism. In a more recent book, Adventure of Modern Art by Oto Bihalji-Merin, a comparison is made of a Mondrian painting and a microphoto of a cell structure. The book does not tell us from what this cell structure was taken, but the fact that it is a cell structure would suggest that it was from something animate, perhaps a plant. So it is possible for exceptions to the rule to exist, and in fact, there may be no valid rule.

"Geometric Forms in art can be thought of as a glorification of a pure extrahuman form; they represent the embodiment of the idea of time, space and movement, freed from the barbarism of instinct and the fluctuations of feeling."[4] This statement from Adventure of Modern Art by Oto Bihalji-Merin, may be right in calling geometric form the embodiment of time, space and movement, but I wonder if instinct and feeling however they may be thought to be supressed, do not still play a very important part, even if subconsciously.

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[4] Adventure of Modern Art, Oto Bihalji-Merin, p.96

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"Geometric art can originate from the urge to stylize the visual image of the real world as well as a desire to express pure thought."[5]

"Inorganic matter, metals, minerals, and crystals are in this phase all more strongly connected with reality and the objectivity of the soul than the perceptual, vegetative, creative elements."[6]

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[5] Adventure of Modern Art, Oto Bihalji-Merin, p.96

[6] Adventure of Modern Art, Oto Bihalji-Merin, p.59

The striking similarities between the works of art pictured and the microphotos paired with them have led to much speculation on the likenesses and differences of science, (as represented by the microphotos) and art. The scientist is likened to the artist because he "pushes forward into a strange world beyond the frontiers of our naive life of the senses."[7] The area of the microscopic is called the "meeting place of art and science". "This discovery that visual elements have a life of their own is the real meeting point of science and the pictorial and plastic arts, which is primarily the world of microscopic forms."[8] This exhibition seems then to have accomplished its objective, which was, to show in general terms how art, when it began to depart from the ordinary representation of visible reality, came strangely near the scientific realities unseen by the naked eye.

"Coincidence of form, however, must not blind us to this one essential difference, that a work of art is an expression of the artists' most deeply subjective emotion, while a scientific illustration is designed to meet a need for information as objective as possible."[9] The obvious difference then, is that the microphoto is a natural "happening", unordered except by nature, and merely observed by the scientist, while the work of art is the product of the conscious mind of the artist, however intuitively produced. This then, is the basic difference between science and art. The microphotos, however have a certain aesthetic beauty of their own which leads to the question of which is the more aesthetically satisfying to us? Is then, the beauty of nature so perfect that it is complete in itself, and should the artist therefore not interpret these forms which have their own intrinsic beauty? Aside from the fact that the beauty of the art was created independently of the stimulus of nature, the artist

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[7] Form in Art and Nature, Adolf Portmann, p.15
[8] Form in Art and Nature, Adolf Portmann, p.17
[9] Form in Art and Nature, Robert Schenk, p.48

if inspired by the forms of nature, will so order them to suit his own expression, or there would be no stimulation to creation (of art) at all, but only to appreciation.

The aesthetic experience we receive from nature differs from that which we get from a work of art. Art cannot reflect nature exactly even though it may seem to, since it is created through human means and is not free from influence of the human personality. "Artistically, the endless inventory of abstract forms in themselves have nothing to say. And if you take ten abstract painters, each of them would differ from the others as a person and an individual. But as to these photographs... what they lack is not only the personal imprint, the shape and form imposed by a human individual, but also, and above all, in comparison with the paintings, that very substance which is the vital fluid of creative art."[10]

"Works of art are of two kinds: those which derive their inspiration from the wealth of forms from the visible world around us, and those which exist in a more elemental sphere, where form and color speak a language of their own."[11] The kind we are considering here, supposedly falls in the second category of artistic directions. "The other direction emancipates itself from nature and transcends it. The latter no longer gives a direct representation of objects, but rather their conceptions and notions. Such an art will deal with mental processes expressed by way of geometric and abstract forms."[12] Why has art gone in this direction and what do artists seek to express that is more than ordinary visual relationships? Adolf Portmann, in Form in Art and Nature, explains, "the reason why many artists have abandoned representational art, in other words the familiar world of

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[10] Form in Art and Nature, Georg Schmidt, p.31

[11] Form in Art and Nature, Adolf Portmann, p.15

[12] Adventure of Modern Art, Oto Bihalji-Merin, p.65

everyday life, is just that this world is encountered often simply through the mind, which imposes its own interpretation on it."[13] Because of the interpretation of the intellect, we have lost the sense of wonder in ordinary things. In order to restore this lost element of mystery, artists were led to abandon the representational modes of expression because of the intellectual and literal connotations that connected with the forms of realism. "In their search for absolute purity, artists were compelled to eliminate natural forms that conceal the purely constructive elements and to replace 'natural form' by 'art form'. This is concrete rather than abstract painting, in the sense that nothing can be more concrete or more real than a line, a color or a plane. One might call this the 'concretion' of the creative mind."[14] The artist attempts then, to do more than just reflect or reproduce the visible world. "The task that the artist today sets himself is not only to make conscious the unconscious, but also to make audible the inaudible, visible the invisible."[15]

Whether or not the artist works directly from the discoveries of science or technology, is he somehow affected by it? I think we can agree that even if he has no direct access to scientific discoveries, he is not totally unaware of what is going on in these realms. Some of us seem to feel that the artist is affected by new directions in scientific research. "The breakthrough of a new conception of time and space and the revolutionary view of macroscopic and microscopic space have persistently expressed themselves in modern art."[16] "Inspired by the sensitive feelers of modern experimental equipment, by gigantic telescopes, microscopes, and x-ray films, painters have touched a heretofore hidden, secret, still uncatalogued but neverthe-

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[13] Form in Art and Nature, Adolf Portmann, p.16

[14] Adventure of Modern Art, Oto Bihalji-Merin, Theo. Van Doesburg, p.95

[15] Adventure of Modern Art, Oto Bihalji-Merin, p.107

[16] Adventure of Modern Art, Oto Bihalji-Merin, p.7

less existing world of forms."[17] Still others seem to feel that by instinct alone the artist produces forms that are later seen to have a relation to scientific reality. "Led by instinct, by the sensitivity of the nervous system, American artists evoke the structural forms of matter, the dynamic principle of life."[18] As for my own opinion, I tend to agree with this statement of Naum Gabo, "The new scientific vision of the world may affect and enhance the vision of the artist as a human being but from there on the artist goes his own way and his art remains independent from science; from there on he carries his own vision bringing forth visual images which react on the common human psychology and transfer his feelings to the feelings of men in general, including the scientists...It is in this field that the constructive contribution of art to human life lies."[19] "Are then microscopy, history, palaeontology, preoccupations of an artist? Only in a relative sense, as a matter of flexibility; not in any sense implying scientific accuracy or a faithful imitation of nature. Only in the sense of freedom, a freedom which simply demands the right to be as flexible as nature herself."[20]

In an earlier section of this text, we found that it is not necessary for the artist to actually work directly from nature in order to produce art that can be shown to conform to nature, and, in fact some artists have attempted to be as far removed from nature as possible in their expression. "The most one can say is that some of them subsequently saw (to their own satisfaction) that science, pursuing its own course, had arrived at results which were formally similar to those acheived by modern art pursuing its own course."[21] The paint-

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[17] Adventure of Modern Art, Oto Bihalji-Merin, p.104

[18] Adventure of Modern Art, Oto Bihalji-Merin, p.73

[19] Adventure of Modern Art, Oto Bihalji-Merin, p.108

[20] Form in Art and Nature, Georg Schmidt, p.33

[21] Form in Art and Nature, Georg Schmidt, p.31

ings shown in this book existed and were art before they were shown to have a relationship to the realities as pictured in the microphotos. This comparison does not make them better as paintings because of similarity to reality, but only adds another dimension to them, at the same time affording us a feeling of wonder that these two different areas of research, science and art, seem now to have paralleled each other so closely. Art has not influenced science in the microphotos, since the scientist is interested only in what the structures look like and what he can learn from them, and any aesthetic experience derived from them must be subordinated to his scientific purpose. In the case of the paintings shown here, the microphotos have not influenced the art, at least not in the sense that the forms are drawn from them.

"Under the microscope, sea animals and plants reveal a reality that the artist has felt without having seen."[22] Some scientific influence can be argued, however, in that we are influenced, consciously or unconsciously, by the totality of our experience, including all visual impressions and sensations stretching back to infancy. It is this raw material that our imagination and instinct works upon and from which we fashion our fantasies and dreams, and all must come from the real world. In this way it can be said that the artist cannot totally reject nature or natural objects as inspiration, since he carries sense impressions of these in his consciousness, however he may rearrange them to convey his unique conception of reality. "There is nothing in nature that is not in us."[23] "If we concentrate our attention on calibrated relationships, the unity of nature and its objects will become visible albeit veiled."[24]

[22] Adventure of Modern Art, Oto Bihalji-Merin, p.106

[23] Adventure of Modern Art, Oto Bihalji-Merin, Naum Gabo, p.107

[24] Adventure of Modern Art, Oto Bihalji-Merin, Mondrian, p.105

From this, I conclude that although it is not necessary for the artist to take his forms from nature, it is not invalid for him to do so, and the forms found in the microphotos, though they may seem strange, are perfectly natural forms. "Modern art has not separated itself from reality any more than has technology. It creates its shapes out of the storehouse of reality, just as much as out of accessible things, or, hurrying ahead of science, out of his own imagination. The creative artistic imagination can anticipate the developmental direction of the conscious inquiring mind."[25]

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[25] Adventure of Modern Art, Oto Bihalji-Merin, p.108

INTRODUCTION TO THE PAINTINGS

The following six paintings comprise the body of work executed for this thesis. The sizes are varied to provide differences in the shape of each canvas, but none are smaller than thirty six inches in width nor longer than fifty inches in length. The stretchers are constructed of clear pine; the canvas was stretched unprimed and coated with gesso. The medium is acrylics, with no applied texture. Some areas give the illusion of texture, but the surfaces of the paintings are flat. The technique is a combination of dry brush and glazing. Many of the accidental effects of the glazing, such as drips, dribbles and runny areas, were retained when they were able to be worked into the painting. The individual paintings and their source material are discussed in the following section.

PAINTING NO. 1

This painting uses as source material a macrophoto of a section of the small intestine which appeared in the January 9, 1970 issue of Life magazine. The impressive qualities of light and dark, the unusual shapes, and the warm color scheme were the elements that caused me to select this particular photo. Considering the macrophoto as a painting in order to work from it, it has one problem- the central dark area tends to cause a bulls-eye effect. Another problem of this macrophoto, as a painting, is the almost monochromatic color. The first problem was solved in the painting by adding additional light areas around the outer edges of the painting, to pull the eye away from the bulls-eye. The second problem was resolved by intensifying the colors that could be seen in the macrophoto. After the more intense colors were added, the painting still seemed to call for something more, so a blue was added to some of the dark areas, in the interest of a better color structure. The completed painting differs in character from the macrophoto, although the relationship between the two is still apparent.

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46x50

PAINTING NO. 2

This painting is done from a microphoto of a thin section of granite. The brilliancy of the contrasting colors and the positioning of the light and dark areas were particularly exciting to me. The color areas in the painting were kept in basically the same arrangement, with changes only in minor shapes which in any case were unnecessary to the organization of the painting. A light area appearing in the microphoto has been heightened in the painting to become the center of interest, and some bright red underpainting is allowed to show through directly alongside this area because the two interact so well within the painting. The painting retains a definite relation to the microphoto, but still has its own character as a painting.

4

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40 x 49

PAINTING NO. 3

This painting was begun from a microphoto of crystals of oxalic acid taken in polarized light. What first attracted me in this microphoto was the muted colors and the unusual way the shapes jutted in from the sides. This type of greyed color would be a departure from the coloration that I would normally have chosen. Unfortunately, when shapes that conformed to those in the microphoto were transferred to the canvas, they could not be made to work together. Moreover, the limited color scheme seemed less exciting when translated to the canvas. The solution to these problems was to radically change the shapes and to introduce more color to the painting until a unified workable whole resulted. This was not the only way I could have resolved these problems, but it was the way that I decided to do it at this particular time. The finished painting bears little likeness to the microphoto, but that was not my primary intention in this case.

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36x49

PAINTING NO.4

This painting is done from a microphoto of the blood vessels of the human kidney. This microphoto is in black and white, which makes the division of dark and light areas more pronounced. It is also an advantage in the sense that there is no color limitation imposed by the microphoto. Of course, any existing color scheme in the microphoto could be discarded and replaced by another in the painting, but the black and white was open to many more possibilities than if a color scheme had already been established. So the major problem of the painting at first was one of color. At the start of the painting, pure colors were used, but they drew the criticism that they looked too "raw". Once the colors were toned down by being glazed over with mixed colors, the painting worked much better. The remaining problems that needed solution were those of eliminating or simplifying some of the shapes in the dark areas, while varying the intervals of light and dark that occurred at the top and bottom edges of the canvas.

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42x48

PAINTING NO. 5

This painting is also done from a black and white microphoto of the columnar structure of an eggshell-- a cross section. The most interesting features of this microphoto are its rich textural qualities and the dark bands appearing at the top and bottom. The dark areas in the central section of the microphoto did not appear to be in the best aesthetic positions, so this was remedied by slightly different placement in the painting. Also, the vertical movement was such a strong one in the microphoto that I added some angular shapes in the painting to slow it down. I had decided to limit myself in color in this painting and to use slightly different color relationships than I normally do in painting. Therefore, I deleted yellow and orange from the palette in this painting and added acra violet and dioxazine purple, colors I seldom use, to the color structure. The dark band across the top of the painting became an ultramarine blue and for the dark horizontal band across the bottom a red oxide was chosen.

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11

46x48

PAINTING NO. 6

This last painting is also done from a black and white microphoto this time the "Golgi apparatus" of a goblet cell. The problems of the microphoto were mainly those of shape. The series of repetitious lines in the upper half of the microphoto would have to be somehow varied in the painting. Also, while the position of the large light area and the shapes surrounding it was good, the shapes themselves were not that interesting. Faced with the choice of color again, I decided in this painting, to use a warm color scheme plus greens, and to eliminate the blue colors which appear in all of the preceeding paintings. The linear area mentioned above was varied in the painting by use of slight variations of color, the red shifting to orange, the orange to yellow, and the yellow to almost white. The problem of the uninteresting shapes in the lower portion of the painting was solved by adding shadows to these areas and playing down the outer edges of these forms.

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42x48

BIBLIOGRAPHY

I. THE TECHNIQUES OF PHOTOMICROGRAPHY AND PHOTOMACROGRAPHY

Croy, Creative Photo Micrography, Focal Press lm., London, 1968, pp. 8-11, 49-55.

II. PARALLEL FORMS IN NATURE AND ART

Readings and References:

Bihalji-Merin, Oto, Adventure of Modern Art, Harry N. Abrams, Inc., Publishers, New York, pp. 38-40,49-54, 58-65,74-77,87-90,102-109.

Gordon, John, Geometric Abstraction in America, Frederick A. Praeger, Pub., New York, 1962, pp.7-14.

Hall, James B., & Ulanov, Barry, Modern Culture and the Arts, Mc Graw-Hill Book Co., New York, pp.3-47,168-175, 192-231.

Henning, Edward B., Paths of Abstract Art, the Cleveland Museum of Art, U. S., 1960.

Herbert, Robert L., Modern Artists on Art, Prentice Hall Inc., New Jersey, 1964, pp.19-44, 114-130.

Jacobus, Lee A.,Aesthetics and the Arts, Western Connecticut State College, Mc Graw-Hill Book Co.,pp.4-53 216-231, 236-261.

Malevich, Kasimir, The Non-Objective World, Theobald and Co., Chicago, 1959, pp.11-50, 67-102.

Schmidt, Georg & Schenk, Robert, Form in Art and Nature, Basilius Presse Basel, 1958, pp. 7-9,11-19,23-35, 41-49.

BIBLIOGRAPHY OF PLATES:

TECHNIQUES OF PHOTOMICROGRAPHY --EXAMPLES

PLATES:

1. Scientific American magazine, Dr. Roman Vishniac, March 1970, p.74
2. Scientific American, June 1969, p.41
3. Scientific American, March 1969, p.31
4. Scientific American, Nov. 1968, p.112
5. Scientific American, April 1968, p.124

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10. Scientific American, March 1970 ,p.94
12. " " ,Feb. 1969, p.104